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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:) Group Art Unit: 3652
Raymon F. Thompson et al.) Examiner: Keenan, J.
Serial No.: 09/575,551)
Filed: 5/22/00)
For: SEMICONDUCTOR PROCESSING)
SYSTEM WITH WAFER)
CONTAINER DOCKING AND)
LOADING STATIONS)

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TRANSMITTAL OF APPEAL BRIEF

Commissioner for Patents
Washington, D.C.

Sir:

1. Transmitted herewith in triplicate, is the APPEAL BRIEF in this application, with respect to the Notice of Appeal filed on August 13, 2001.

2. FEE FOR FILING APPEAL BRIEF

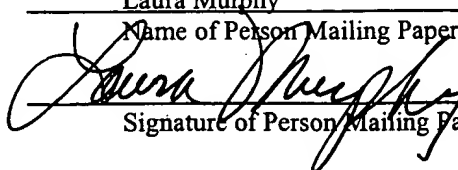
Pursuant to 37 CFR 1.17(c), the fee for filing the Appeal Brief is \$320.00.

CERTIFICATE OF MAILING
(37 C.F.R. §1.8a)

I hereby certify that this paper (along with any referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as First Class Mail in an envelope addressed to the Commissioner for Patents, Washington, D.C. 20231.

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3. EXTENSION OF TERM

Applicants believe that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicants have inadvertently overlooked the need for a petition and fee for extension.

4. TOTAL FEES DUE

Appeal Brief Fee \$320.00

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5. The Commissioner is hereby authorized to charge any underpayment of the fees associated with this communication, or credit any overpayment, to Deposit Account 12-2475.

Respectfully submitted,

LYON & LYON LLP

Dated: October 22, 2001

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APL
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#9

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE



In re Application of:

Raymon F. Thompson et al.

Serial No.: 09/575,551

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For: SEMICONDUCTOR PROCESSING
SYSTEM WITH WAFER
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) Group Art Unit: 3652

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Copy of papers
originally filed

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GROUP 3600

APPELLANT'S BRIEF

Commissioner for Patents
Washington, D.C. 20231

Sir:

I. Real Party In Interest

The real party in interest is the assignee, Semitool, Inc., a Montana corporation having its principal place of business at 655 West Reserve Drive, Kalispell, MT 59901.

II. Related Appeals and Interferences

The appellant and real party in interest, and the appellant's legal representative, know of no other appeals or interferences which will directly affect or be directly affected by, or have a bearing on the Board's decision in the pending appeal.

LA-212875.1

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III. Status of Claims

The pending claims, and the claims appealed, are 56, 57, 62, 64 and 65. All other claims are canceled.

The original application was filed with claims 1-55. In a Preliminary Amendment mailed on May 22, 2000, claims 1-55 were canceled and new claims 56-63 were added.

In an Amendment mailed February 27, 2000(?) in response to an Office Action mailed November 9, 2000, claims 58-61 and 63 were canceled, claims 56-57 amended, and new claims 64-65 added.

IV. Status of Amendments

No amendments have been filed subsequent to the May 11, 2001 Final Rejection. All amendments filed before the May 11, 2001 Final Rejection were entered.

V. Summary of the Invention

The invention relates to a method for processing a workpiece such as a semiconductor wafer. The claims on appeal describe an "alternative" wafer loading subsystem 600 as illustrated in Figs. 40-49 and described in the specification at pages 52-56. The "primary" loading subsystem 43 is shown in Figs. 6-12 and described at page 12, line 18-page 13, line 12. Either loading subsystem may be used in the processing system 40 of Figures 1 and 13-15. Of significant importance to the 35 USC § 112 issues on appeal, the specification, at page 52, lines 11-17, specifically states that the alternative loading subsystem 600 shown in Figs. 40-49 "shows the important parts of this loading subsystem in isolation from other parts of a system otherwise similar to processing system 40."

Turning to a description of the subsystem 600, as shown in Figs. 40-49 and described at pages 52-56, a sealed container, holding a wafer in a horizontal orientation, is moved to an interface port of a processing system. Referring to Fig. 40, the carrier 51 shown in dotted lines has slots for holding wafers, with the slots extending perpendicular to the open front end of the carrier, as shown, for example, also in Fig. 1. The sealed container is then unsealed by removing a panel. Page 55, lines 3-10. The wafers are then engaged with an engagement head, as shown in Figs. 42-43, and described at page 55, lines 20-22. The engagement head pivots up, so that the wafers are moved from a horizontal orientation, as shown in Fig. 43, into a vertical orientation, as shown in Fig. 45. The wafers are then released and placed onto a shelf, while in a vertical orientation, as shown in Fig. 48. From there, the wafers are lifted, carried, placed into a process chamber, and processed within the process chamber, and as also shown in Figs. 13-15 and described at pages 25-26.

VI. Issues

- A. Issue No. 1: Whether Claims 56, 57, 62, 64 and 65 are Patentable Under 35 USC § 103(a) Over Iwai, et al. in View of Kawabata
- B. Issue No. 2: Whether Claims 56, 57, 62, 64 and 65 are Indefinite Under 35 USC § 112, Second Paragraph, in View of the Recitation of "and Similar Articles" in Claims 56 and 65

- C. Issue No. 3: Whether the Amendment Filed on March 5, 2001 Introduces New Matter with Respect to the Description in Claim 65 that the Transfer Robot is Moved in a Second Direction Perpendicular to the First Direction, and Correspondingly Whether Claim 65 is Properly Rejected Under 35 USC § 112, First Paragraph, as Containing New Matter
- D. Issue No. 4: Whether the Drawings of the Application Illustrate the Perpendicular Movement Described in Claim 65

VII. Groupings of Claims

Claims 56, 57, 62 and 64 are in Group I. Claim 65 is in Group II, distinct from Group I, due to the new matter rejection of claim 65 only. Consequently, the claims of Group I are separately patentable even if Group II (claim 65) is not patentable due to the 35 USC § 112 new matter rejection.

VIII. Argument

A. 35 USC § 112, First Paragraph, Rejection of Claim 65

The step of claim 65 rejected under 35 USC § 112, first paragraph, as set forth in ¶ 5 of the May 11, 2001 Final Office Action is: "Carrying the article on the transfer robot to a process chamber by moving the transfer robot in a second direction, perpendicular to the first direction."

The first direction is the direction of movement of the engagement head, described at line 6 of claim 65: "Engaging the article with an engagement head by moving the engagement head in a first direction."

The engagement head is 616 in Figs. 45-47. As shown in these figures, the engagement head is moved "in a first direction" i.e., vertically on the relay arm 614, in an arc moving about the relay pivot drive 619. Hence, the "first" direction is the vertical up/down direction. With

reference to lines 13-14 of claim 65, the wafers are then moved in a second direction perpendicular to the first direction, by the transfer robot 157 shown in Fig. 49. Fig. 49 is a side or end view of the alternative loading subsystem shown in Fig. 40. This view, taken together with Figs. 1 and/or 13-15 make it clear that the lateral movement of the robot arm 157 in e.g., Figs. 13-15, is perpendicular to the vertical movement of the pivoting engagement head shown in Figs. 45-47. Significantly, the robot arm in Fig. 49 is designated with element no. 157, which is the same element number used in Figs. 13-15.

Accordingly, the "perpendicular" movement at line 14 of claim 65 is well supported in the Application as filed, and is not new matter.

As for the objection to the drawings, the step at issue in claim 65 is already shown in the drawings, in Figs. 13-15.

In response to the Examiner's observation at ¶ 2 of the Final Office Action that the claims are limited to the embodiment of Figs. 40-49, the specification as filed, at page 52, lines 11-18, clearly sets forth that Figs. 40-49 comprise an alternative loading subsystem, for use in place of the system 43 shown in Fig. 6 and Figs. 13-15. The apparatus 600 in Figs. 40-49 is described as an alternative loading subsystem. A plain reading of the specification suggests only that it is an alternative to the loading subsystem 43 described at page 12, line 18 – page 13, line 20. While the apparatus 43 is described there as an "interface section" and not as a primary loading subsystem, the apparatus 43 is also described at page 13, line 1, as functioning as an input subassembly and an output subassembly. These terms are synonymous with "loading subsystem".

Consequently, the final rejection of claim 65 under 35 USC § 112, first paragraph, at paragraph 5 of the May 11, 2001 Final Office Action, should be reversed. Correspondingly, the objection under 35 USC § 132, and the objection to the drawings under 37 CFR § 1.83(a), as set forth in paragraphs 2 and 3 of the May 11, 2001 Final Office Action, should also be reversed.

B. The Rejection of Claims 56 and 65 Under 35 USC § 112, Second Paragraph

Claims 56 and 65 are rejected under 35 USC § 112, second paragraph, as being indefinite, because the preamble of each claim includes: "a method for processing a semiconductor wafer, data disc, semiconductor substrate and similar articles requiring very low contaminant levels."¹

The specification, at page 1, lines 6-10 reads:

This invention relates to automated semiconductor wafer processing systems for performing liquid and gaseous processing of wafers. Such systems can be used to process semiconductor wafers, data discs, semiconductor substrates and similar articles requiring very low contaminant levels.

The term "and similar articles requiring very low contaminant levels," within the context of claims 56 and 65, read in light of the specification meets the requirements of 35 USC § 112, second paragraph, as the person skilled in the art will understand the classification of articles included by the claim language.

¹ Claim 56 recites "article."

C. The 35 USC § 103(a) Rejections

All of the claim on appeal (56, 57, 62, 64 and 65) are rejected under 35 USC § 103(a) as being unpatentable over Iwai et al. in view of Kawabata, for the reasons set forth at paragraph 9 of the Final Office Action.

Iwai, et al. discloses a heat treatment apparatus which operates on wafers supplied within sealed containers. However, the wafers remain in a horizontal orientation at all times. Consequently, at a minimum, the following steps of claims 56 and 65 are not disclosed by Iwai, et al.:

- 1.) pivoting the engagement head to move the article from a horizontal orientation into a vertical orientation.
- 2.) placing the article on a shelf with the article in a vertical orientation.

The secondary reference Kawabata '715 describes a wafer transfer apparatus used to transfer wafers between carriers. No processing steps are involved. The wafers begin and end in a horizontal orientation, with no processing in-between the reorienting.

In contrast to the claims on appeal, Kawabata does not disclose engaging or disengaging wafers. In Kawabata, the carriers C1 and C2 are fixed to the table 11 of the carrier stage 10. Column 4, lines 10-12. Consequently, there can be no engagement or disengagement between the carriers C1 and C2 and the table 11. In addition, in Kawabata, there is no engagement or disengagement of wafers. The wafer maintainers 20A and 20B in Kawabata pivot upwardly against the wafers, to prevent the wafers from falling out of the carriers C1 and C2 when the table 11 is pivoted upwardly. Unlike the claimed operation of the engagement head, the Kawabata wafer maintainers 20A and 20B do not move the wafers from a horizontal position to

a vertical position, or vice versa, because they do not engage the wafers. They cannot pull on the wafers or change the orientation of the wafers. Rather, they can only push to hold the wafers in place as the table 11 is pivoted downwardly. Accordingly, Kawabata does not suggest any engagement step. Similarly, in Kawabata, there is no releasing of the wafers. Rather, there is merely contacting the wafers, to prevent them from falling. Neither the table 11 or the maintainers 20A and 20B suggest the claimed engagement head operation.

Table 11 of the carrier stage 10 is the only element in Kawabata that can move the wafers from a horizontal orientation into a vertical orientation. The wafer maintainers 20A and 20B cannot perform that function. Consequently, to the extent Kawabata discloses engaging an article with an engagement head (which applicant contends Kawabata does not disclose) elements 10 and 11 of Kawabata would correspond to the engagement head. However, with this reading of Kawabata, there is no engagement or releasing step, because apart from the one quarter turn downward re-orientation, the table 11 of the carrier stage 10 does not act on the wafers.

Accordingly, the combination of Iwai, et al. '383 and Kawabata '715 does not suggest the steps in lines 8-15 of amended claim 56.

Regarding claim 65, the transfer robot moves in a direction perpendicular to the direction of movement of the engagement head. In Iwai, et al., the wafers appear to move in longitudinal and vertical directions, but not in a lateral direction, as shown by the arrows in Figures 1 and 4 (as opposed to air movement which apparently does move in a lateral direction). Figures 2, 13 and 18 show the carrier laterally aligned with the wafer boat 6 or 106, suggesting an absence of lateral movement. In contrast, referring to Figures 1 and 49 of the application, lateral movement

of the wafers to the processing stations 71-73 provides for a more compact design, requiring less costly floor space in a fabrication facility.

In view of the foregoing, it is submitted that the claims are patentable over the prior art. Accordingly, a reversal of the rejections and a Notice of Allowance is requested.

Respectfully submitted,

LYON & LYON

Dated: October 22, 2001

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APPENDIX



CLAIMS ON APPEAL
Serial No. 09/575,551

56. A method for processing a semiconductor wafer, data disk, semiconductor substrate and similar article requiring very low contaminant levels comprising the steps of:

moving a sealed container, holding at least one article in a horizontal orientation, to an interface port of a processing system;

unsealing the container by removing a panel of the container, to provide access to the article in the container;

engaging the article with an engagement head;

pivoting the engagement head to move the article from a horizontal orientation into a vertical orientation;

releasing the article from the engagement head;

placing the article on a shelf with the article in a vertical orientation;

lifting the article off of the shelf with a transfer robot;

carrying the article on the robot to a process chamber;

opening the process chamber;

moving the article into the process chamber;

closing the process chamber;

processing the article in the process chamber.

57. The method of claim 56 where the interface port is part of a processing system within an enclosure.

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62. The method of claim 56 wherein removing the panel of the container places the interior of the container in fluid communication with the workspace within the enclosure.

64. The method of claim 56 wherein the engagement head is pivoted upwardly to move the article from the horizontal to vertical orientation.

65. A method for processing a semiconductor wafer, data disk, semiconductor substrate and similar articles requiring very low contaminant levels, comprising the steps of:

moving a sealed container holding at least one article in a horizontal orientation, to an interface port of a processing system;

unsealing the container, to provide access to the article in the container;

engaging the article with an engagement head by moving the engagement head in a first direction;

pivoting the engagement head, to move the article from a horizontal orientation into a vertical orientation;

releasing the article from the engagement head and placing the article on a shelf with the article in a vertical orientation;

lifting the article off of the shelf with a transfer robot;

carrying the article on the transfer robot to a process chamber by moving the transfer robot in a second direction, perpendicular to the first direction;

opening the process chamber;

placing the article into the process chamber;

closing the process chamber; and

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processing the article in the process chamber.